(No Model.)

W. L. JUDSON.

REHEATING DEVICE FOR COMPRESSED AIR.

No. 420,878. Patented Feb. 4, 1890.

Fig. I.

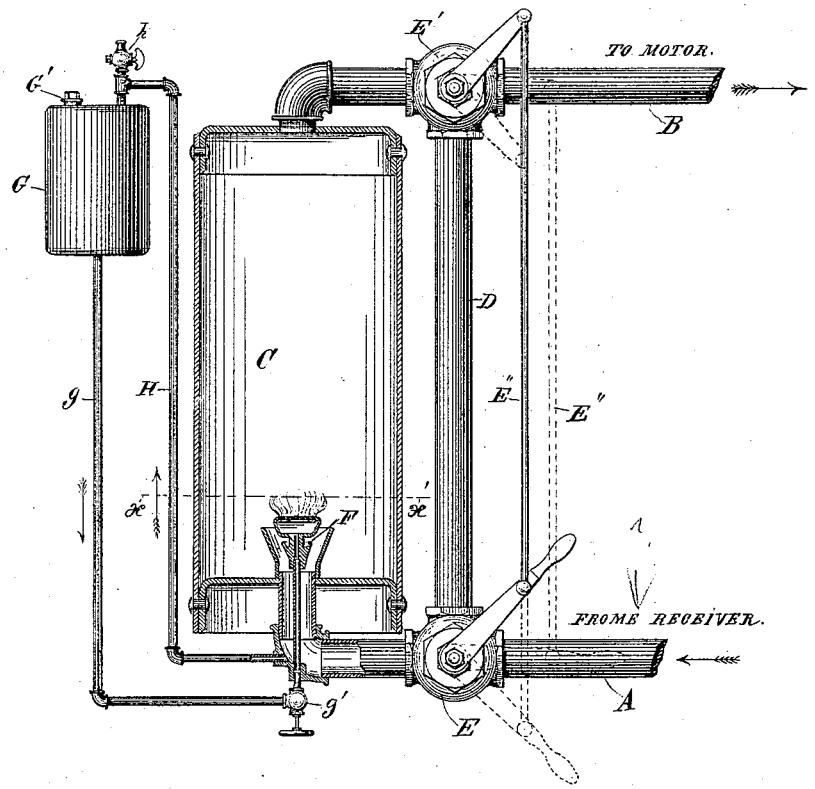
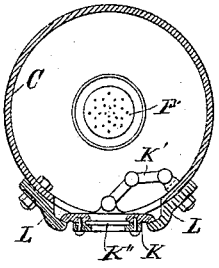


Fig 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

WHITCOMB L. JUDSON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE JUDSON PNEUMATIC STREET RAILWAY COMPANY, OF SAME PLACE.

REHEATING DEVICE FOR COMPRESSED AIR.

SPECIFICATION forming part of Letters Patent No. 420,878, dated February 4, 1890.

Application filed June 17, 1889. Serial No. 314,625. (No model.)

To all whom it may concern:

Be it known that I, WHITCOMB L. JUDSON, a citizen of the United States, and a resident of the city of Menneapolis, county of Hennepin, State of Minnesota, have invented a certain new and useful Improvement in Reheating Devices for Compressed Air, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improved device for utilizing compressed air as a motive power.

As is well known to persons skilled in the art, if the motor through which the power is to be applied be at any considerable distance from the compression, there is a great loss of power by the radiation of heat. The air under the high temperature at the receiver is much more effective than it is at a low temperature at the distant motor. The heat-units are also force-units.

Various devices have hitherto been designed for reheating the air at or near its admission to the motor. Most of these devices, however, so far used have been designed with a view of reheating the air by the external application of heat, either by direct application of fire to some part of the air-pipe or by passing the air-pipe through hot water or other liquid.

My device is designed to reheat the air by burning oil or gas directly within the body of compressed air itself at a point near its admission to the motor; and it consists in the construction hereinafter fully described, and particularly pointed out in the claims.

In the drawings, like letters referring to like parts, Figure 1 is a vertical longitudinal section of my device, some of the parts being shown in side elevation; and Fig. 2 is a horizontal section of the reheating-chamber on the line X X′ of Fig. 1.

A is the supply-section of the air-main leading from the receiver, and B the section leading to the motor.

C is the connecting-section enlarged to adapt it to serve as a combustion and expansion chamber.

D is the pass-pipe connecting the sections A and B independently of the reheating-section C.

E E′ are three-way valves having a common connection E″, adapted to throw the air through the reheating-chamber or pass it out of contact with the burner at will.

F is a burner constructed on the Bunsen or Argand principle, located within the reheating-chamber C.

G is a reservoir of oil or gas in communication by pipe *g* with the burner F, and provided with a valve *g′*.

H is an air-duct extending from the air-main to the top of the reservoir G, provided with the stop-cock *h*.

G′ is an ordinary plug in the reservoir G for supplying oil to the same.

K is a door in the reheating-section C for affording access to its interior. The door is attached to the interior of the section C by a toggle-joint K′, so that it may be swung inwardly without interference with the burner. The opening is provided with projecting flanges L, against which the door is seated by the pressure within the reheating-chamber. The door is provided with a central glass panel K″, for the purpose of affording sight of the burner.

The operation is evident from the description already given. The pressure within the reheating-chamber and behind the oil being equal, the oil will be freely fed to the burner. The air under pressure supplies a superabundance of oxygen, making the combustion very complete and producing a great quantity of heat. In this manner the air may be supplied to the motor at a temperature equal to or even greater than its temperature at the compressor. The gases produced by the combustion will afford additional pressure without injurious effects where the exhaust from the motor is into the open air. In case it is desired to examine the burner, the air may be temporarily conducted to the motor-section through the pass-pipe D.

I am aware that it is not broadly new to reheat compressed air by a gas or oil burner located within the air-main itself. Neither do I claim to be the first to provide a construction for equalizing the pressure within the air-main and the oil-reservoir.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination, with an air-main, of a

burner within one section thereof in communication with a supply of oil or gas, and a pass-pipe connecting the main sections leading to and from the burner-section, provided with valves, substantially as described, whereby the air may be passed in or out of contact with the burner at will.

2. The combination, with an air-main provided with an enlarged section containing a burner, of a door opening inward and held to its seat by the pressure of the compressed air within said enlarged section, substantially as and for the purpose set forth.

3. The combination, with an air-main, of a burner within one section thereof in communication with a supply of oil or gas, a pass-pipe connecting the main sections leading to and from the burner-section provided with valves for passing the air aside from the burner-section at will, and a pressure-seated door in the burner-section for affording access to the burner, substantially as described.

4. The combination, with an air-main provided with an enlarged section, of a burner within said section, and a pressure-seated door having a pane of translucent material, through which the burner can be observed, substantially as set forth.

5. The combination, with an air-main having an enlarged section, of a pressure-seated door connected to the wall of the enlarged section by a toggle-joint, substantially as set forth.

WHITCOMB L. JUDSON.

In presence of—
JAS. F. WILLIAMSON,
EMMA F. ELMORE.